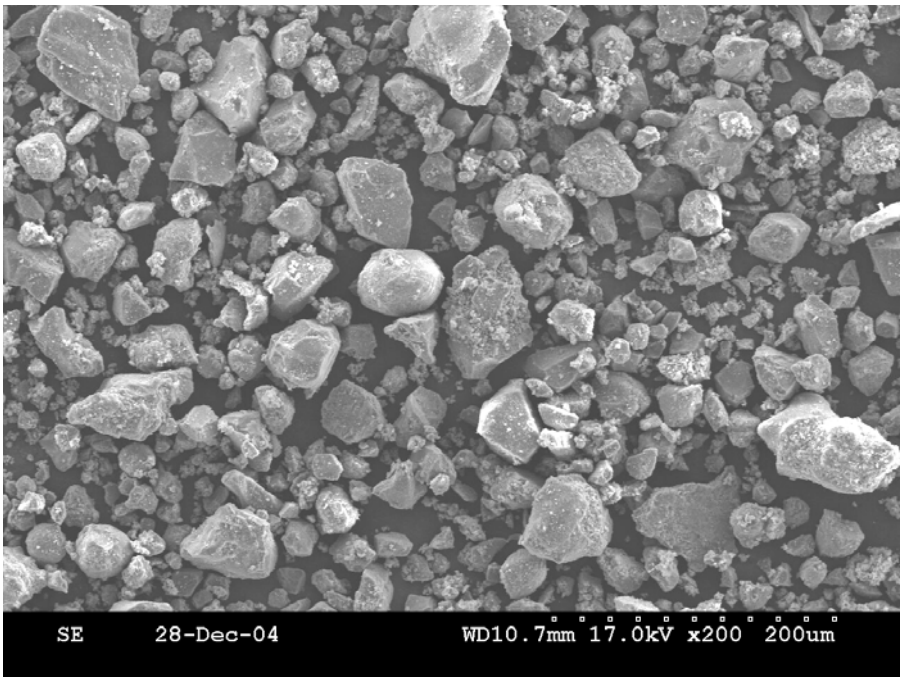
APPENDIX C

Microscopical Examination of Coarse Fractions of Cements Without SCM's

REPORT OF SCANNING ELECTRON MICROSCOPY (SEM) ANALYSIS

METHOD

Sample preparation involved initially sieving with acetone on a 10 μm sieve. The retained fraction was evaluated by both "powder mount" and "polished section". A portion of each sieved fraction was examined by mounting on carbon tape ("powder mount") and sputter-coating with gold to prevent charging. A portion of each sieved fraction was also examined by mounting in epoxy, grinding and lapping to produce a cross-section ("polished section"). The specimens were examined using an Hitachi S-2600N scanning electron microscope (SEM). SEM photomicrographs are secondary electron images (SEI) and backscattered electron images (BSI). The photomicrographs include the following information as read from left to right: date, photograph identification number, working distance, beam energy in keV, magnification factor, and scale bar.



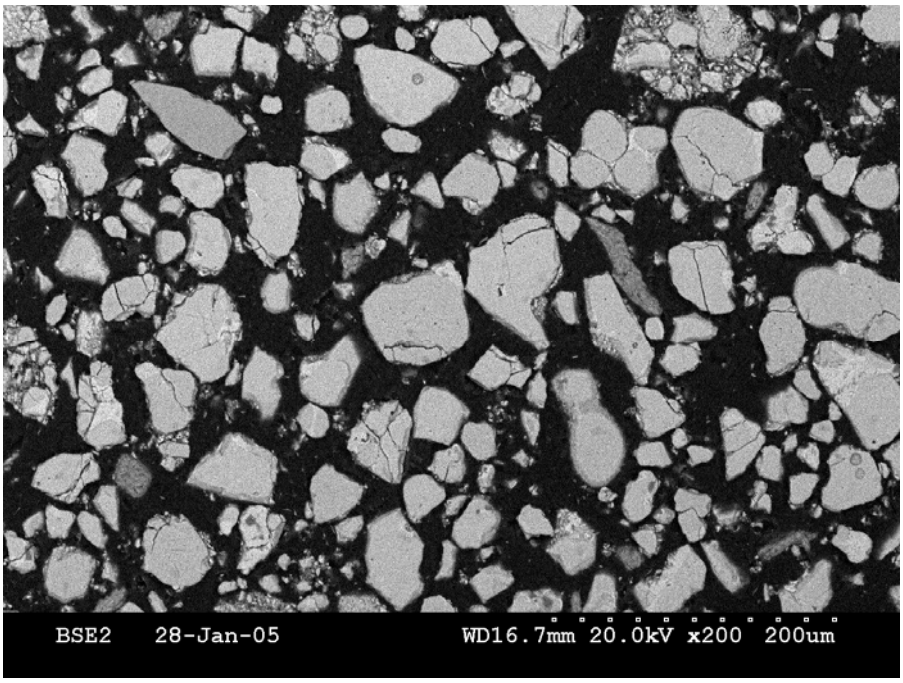
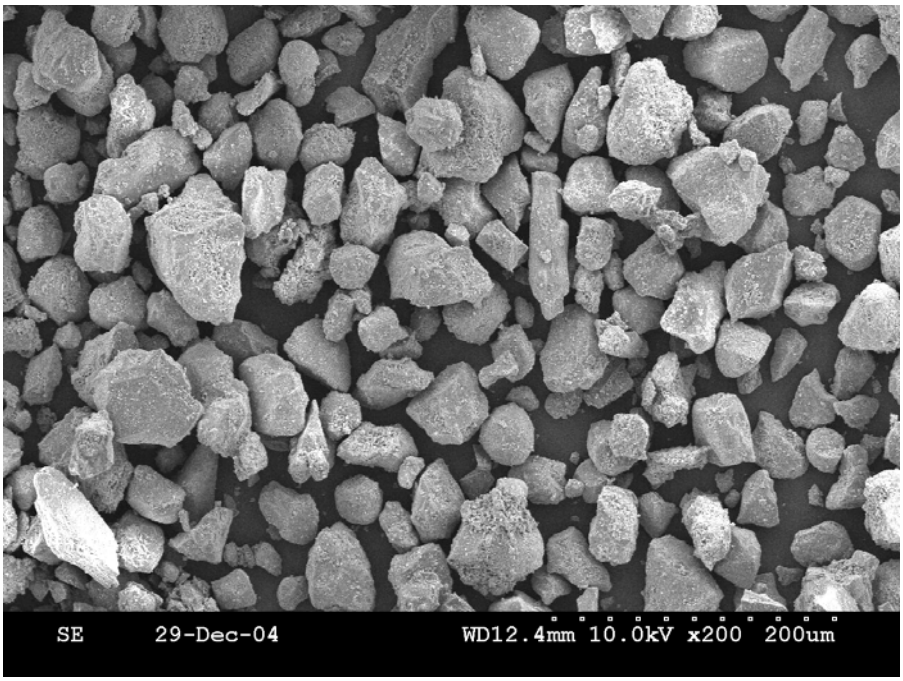


FIG. D1: Sample "Blend 1"; Low C_3A, no addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



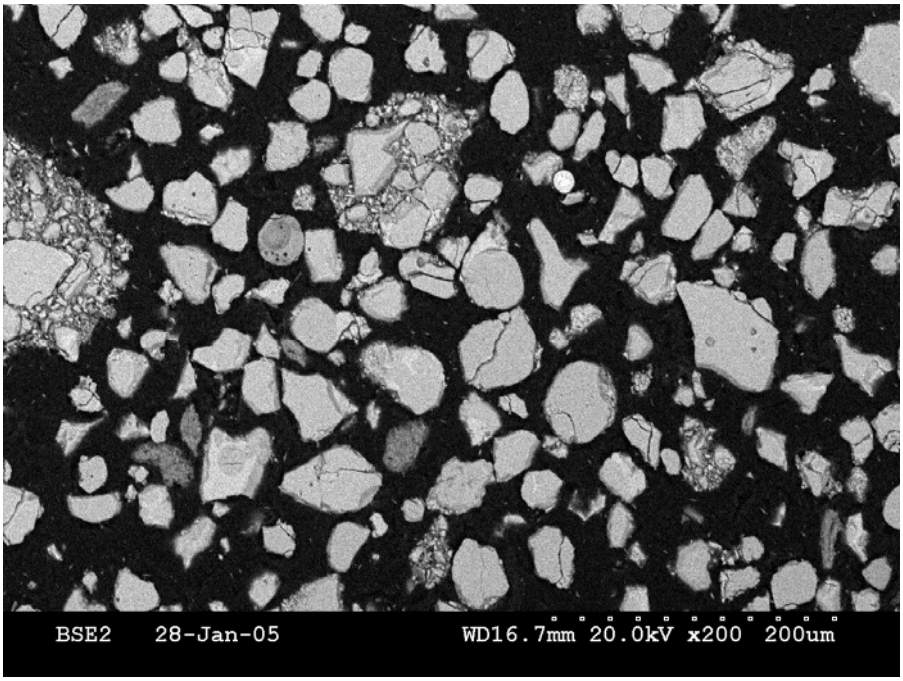
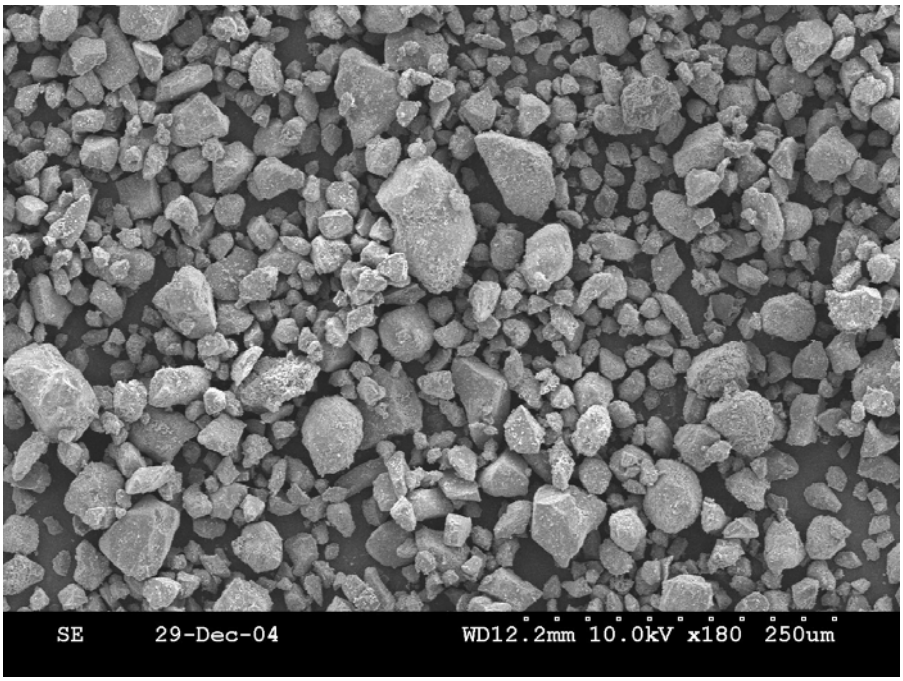


FIG. D2: Sample "Blend 11"; Low C3A, 3% maximum fly ash addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



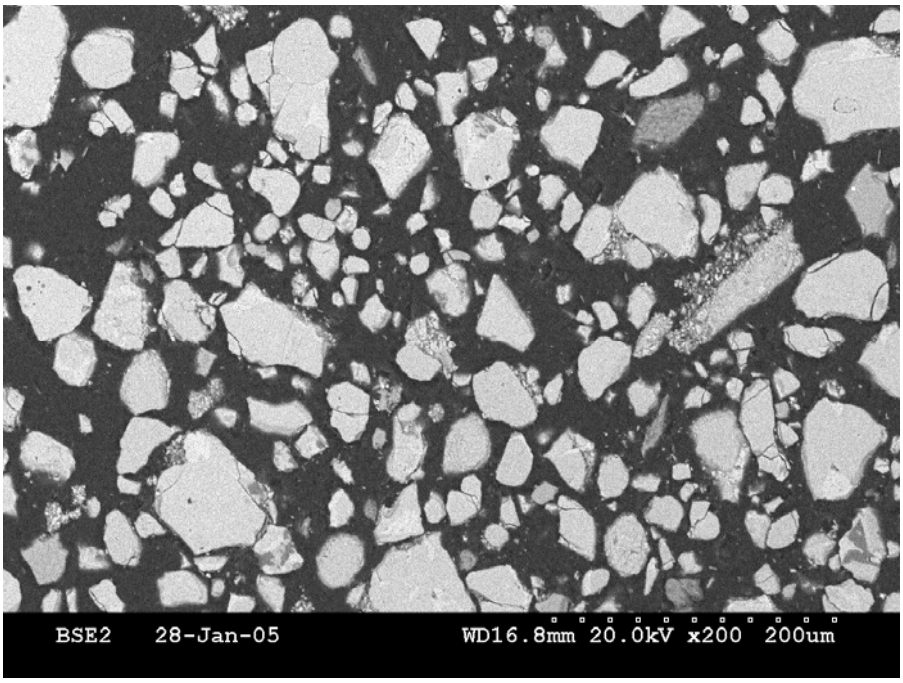
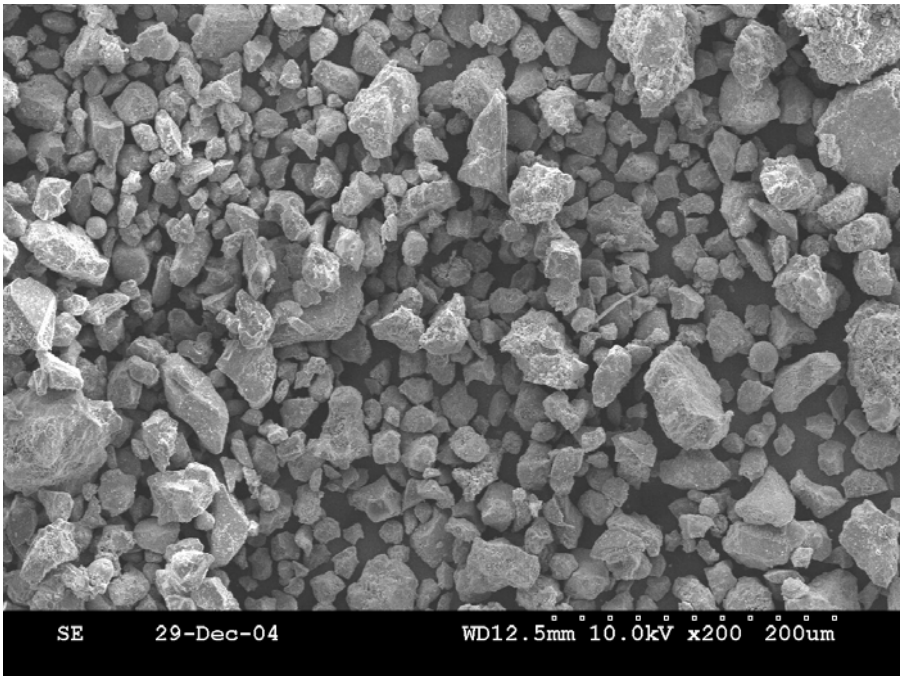


FIG. D3: Sample "Blend 17"; Low C3A, 7.5% slag addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



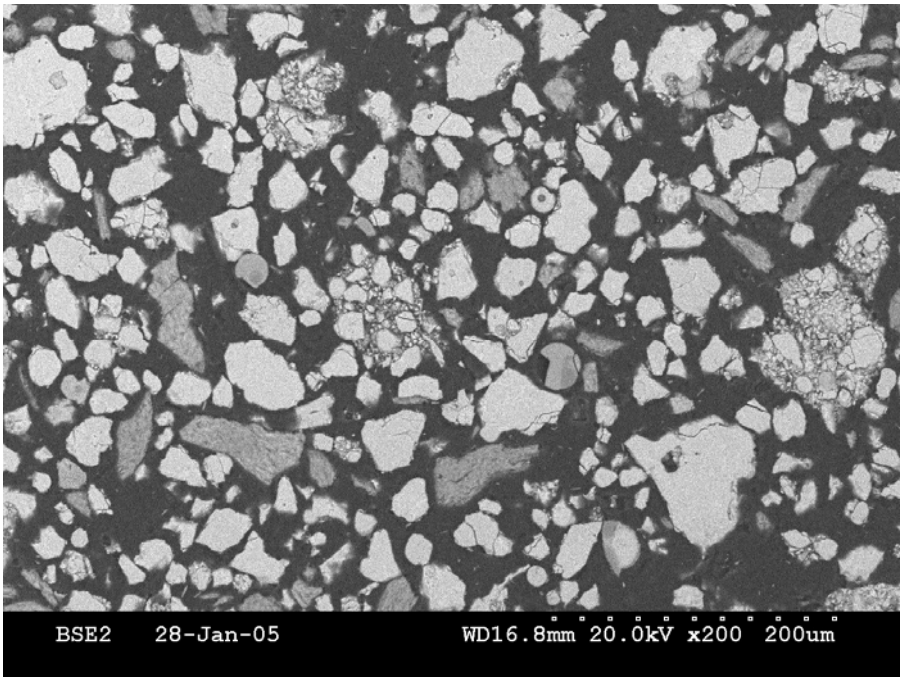
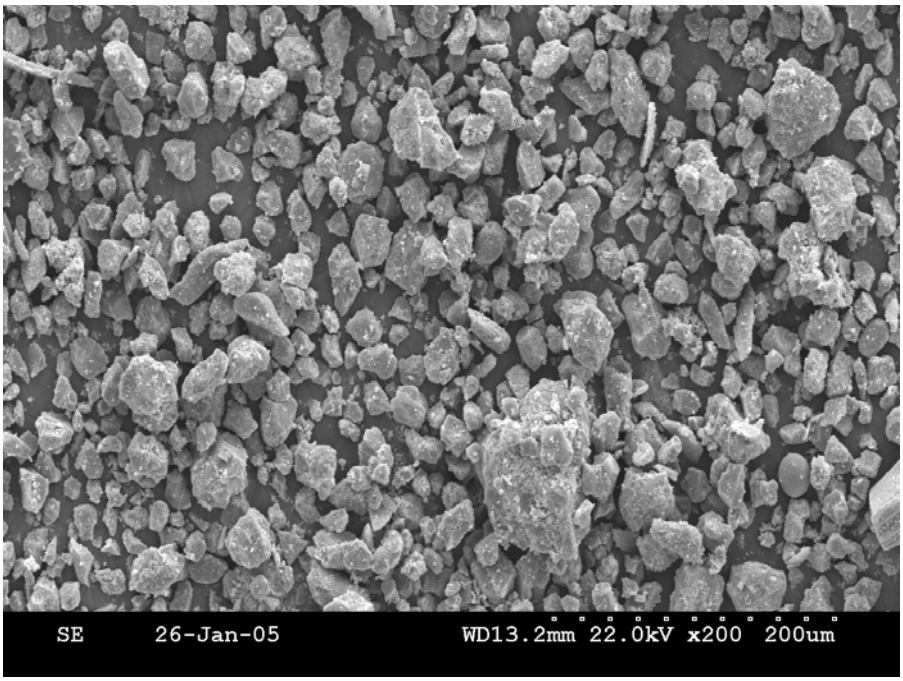


FIG. D4: Sample "Blend 33"; Mid C3A, 4.1% C fly ash addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



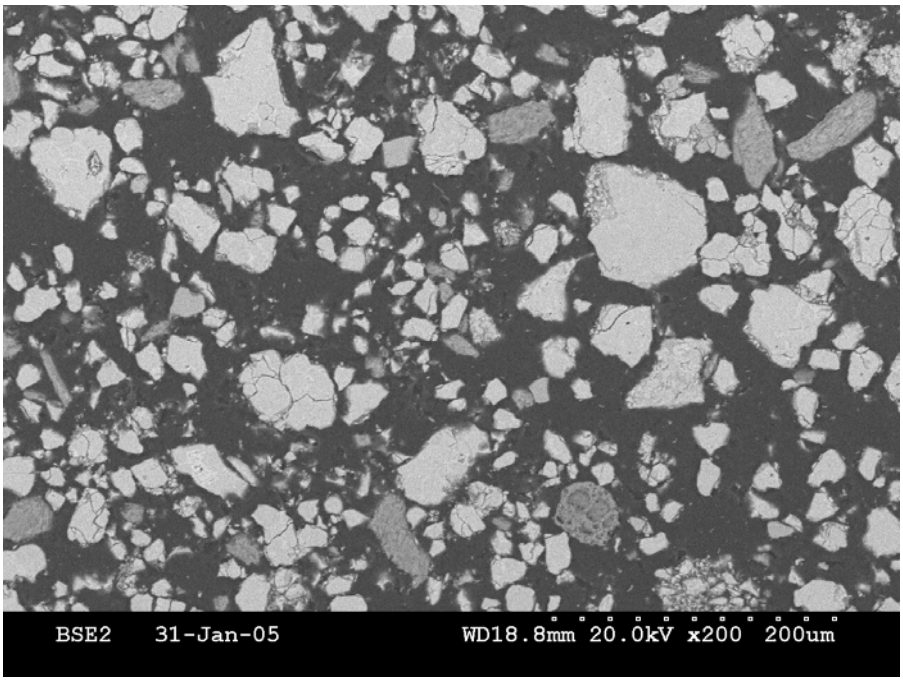
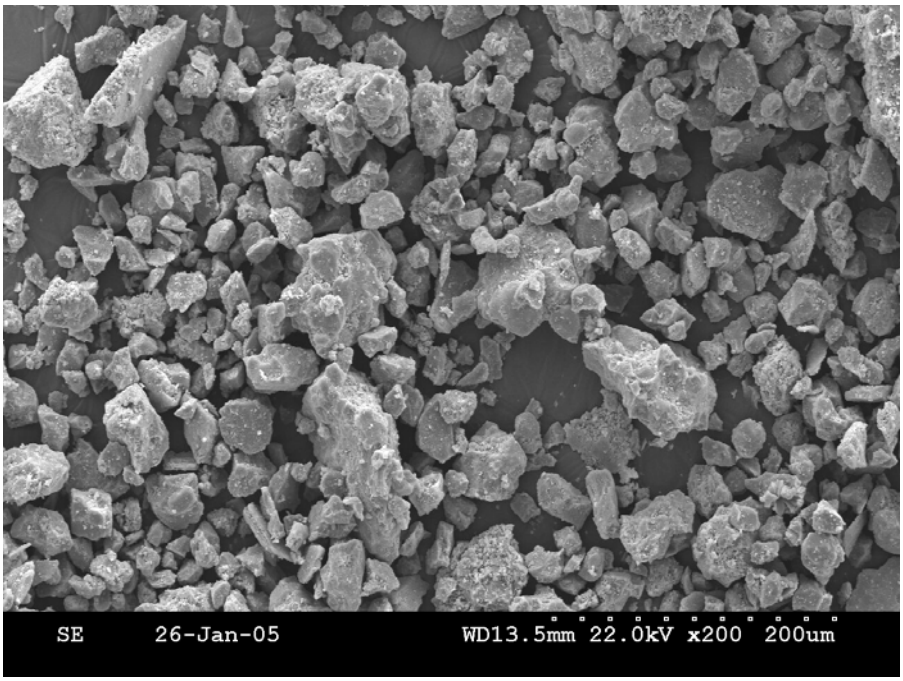


FIG. D5: Sample "Blend 43"; Mid C3A, 7.5% slag addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



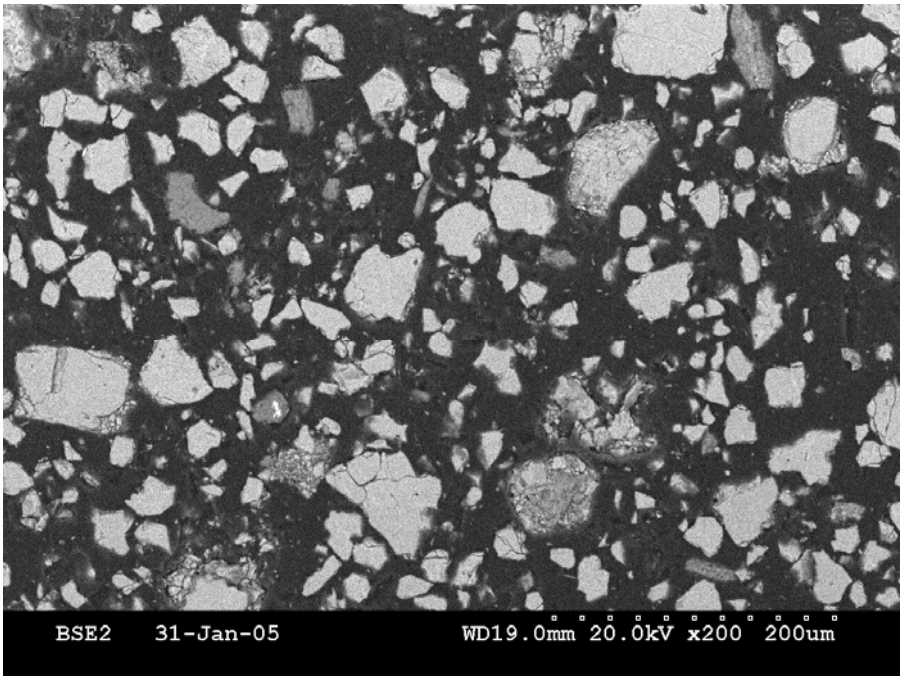
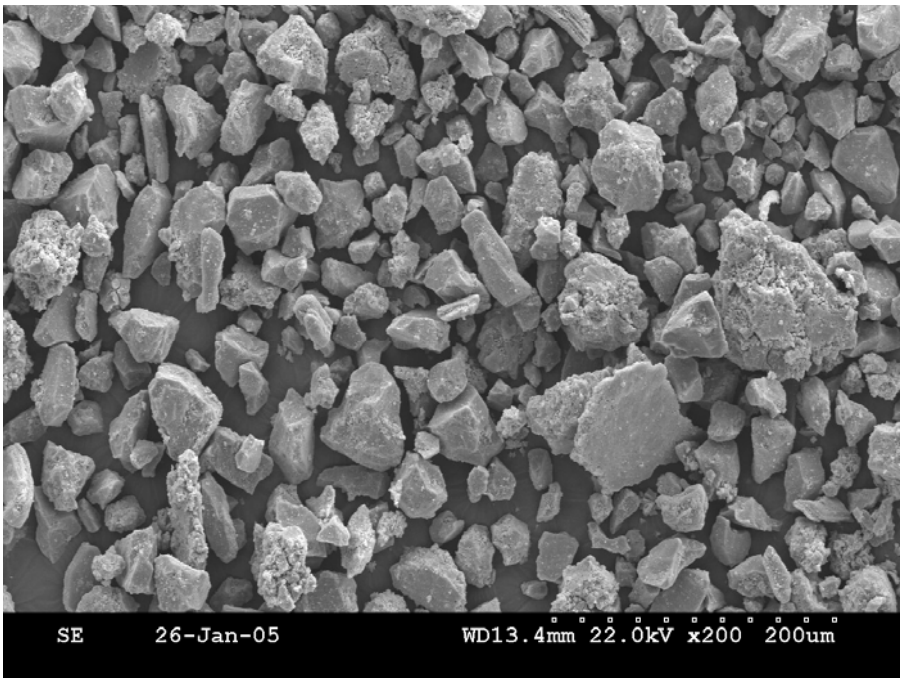


FIG. D6: Sample "Blend 50"; Mid C3A, 7.5% CKD addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



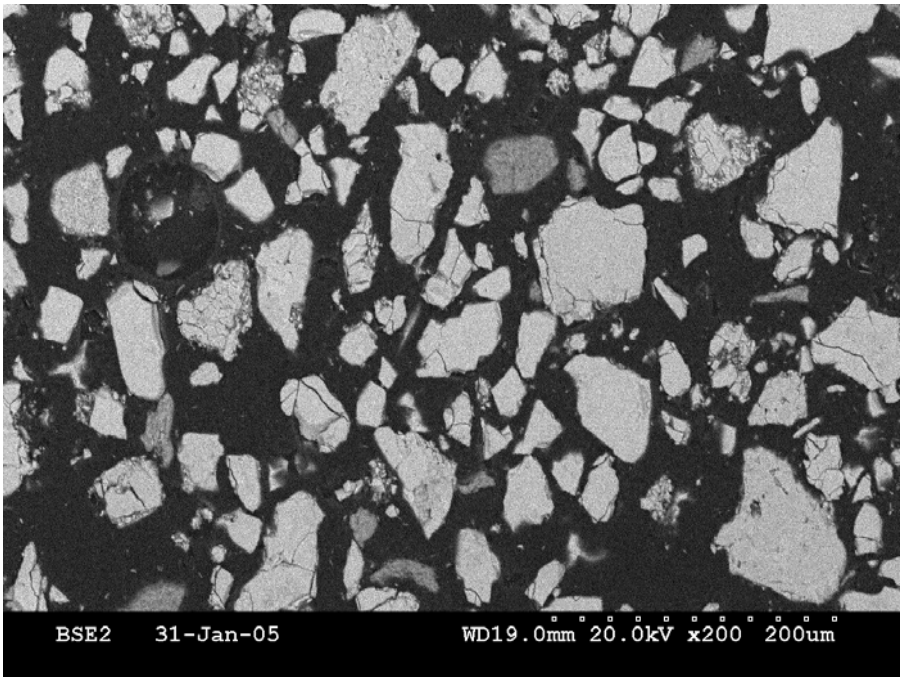
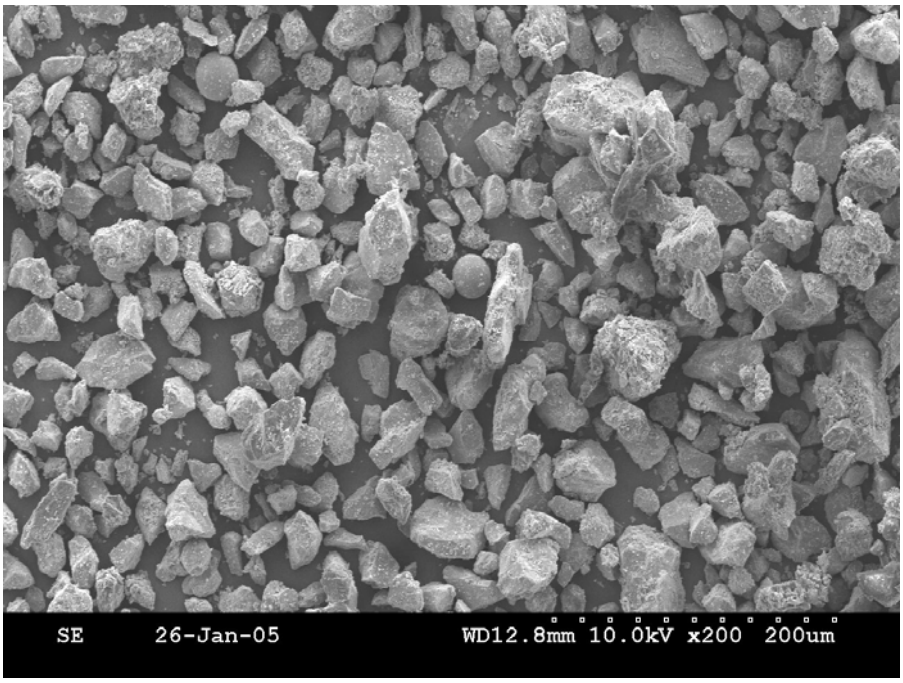


FIG. D7: Sample "Blend 52"; High C3A, no addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



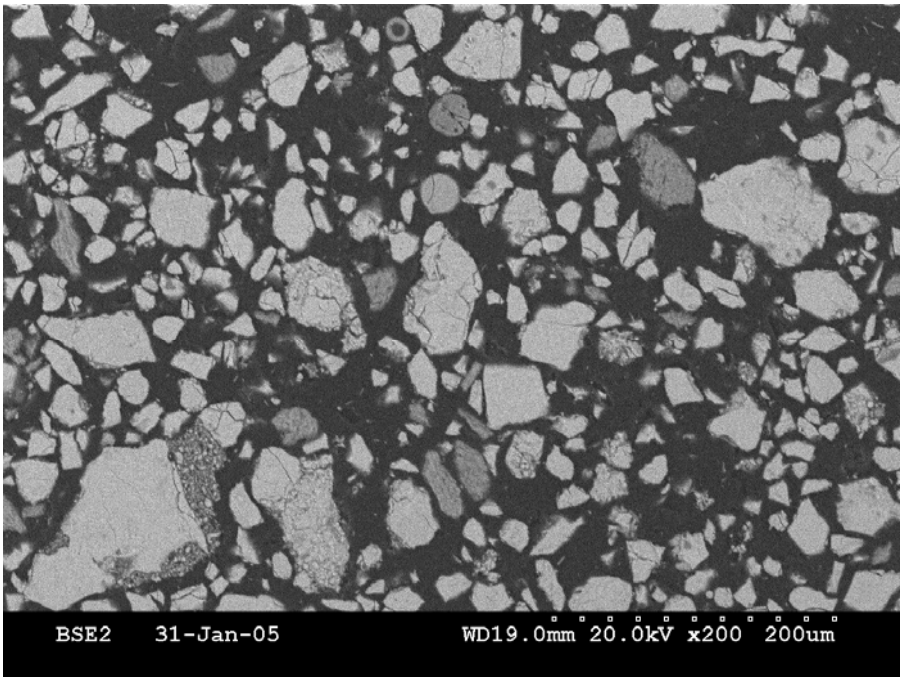
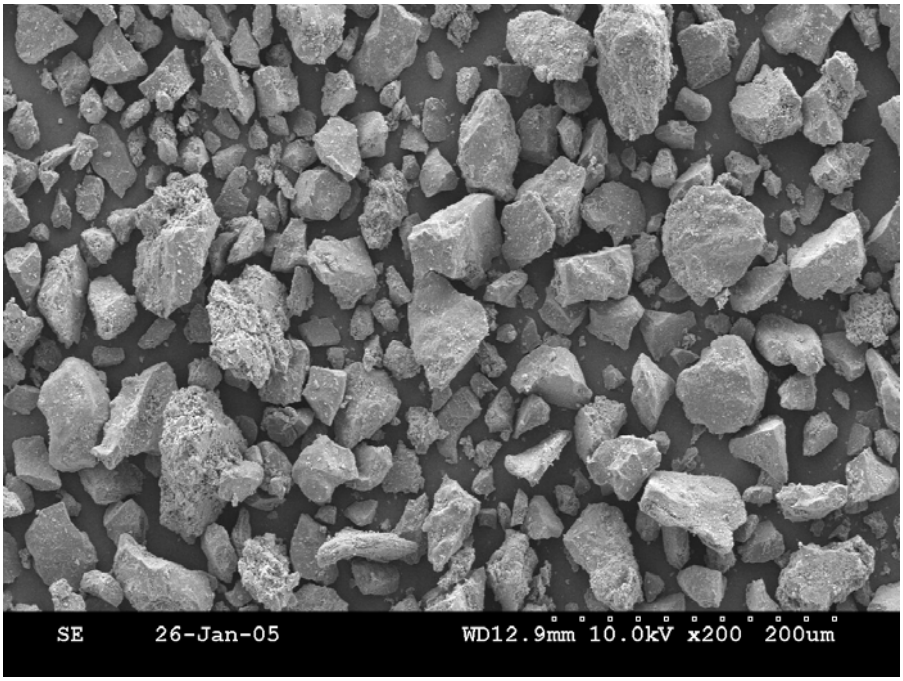


FIG. D8: Sample "Blend 58"; High C3A, 3.7% C fly ash addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



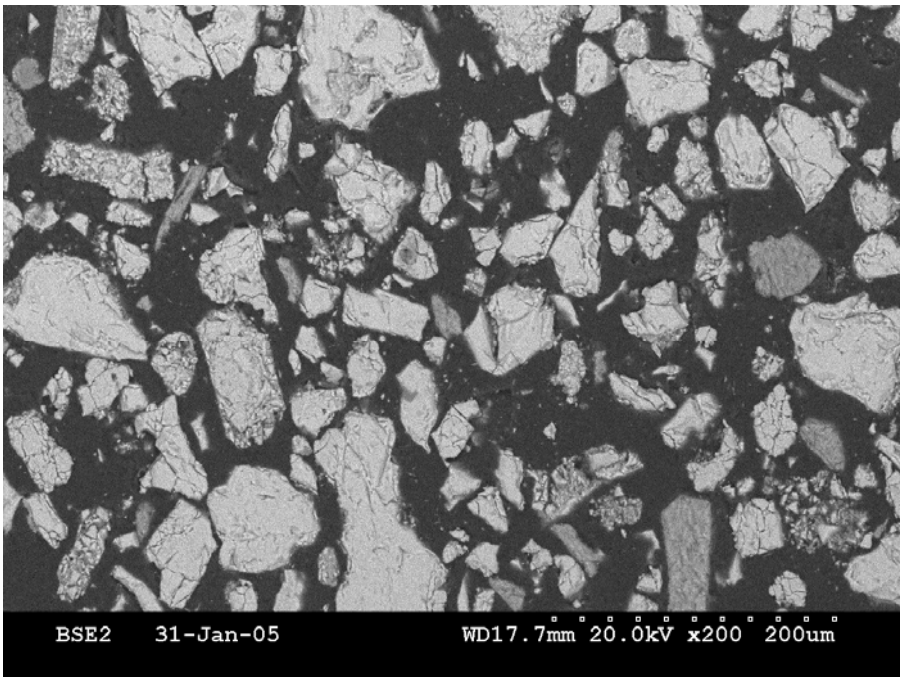
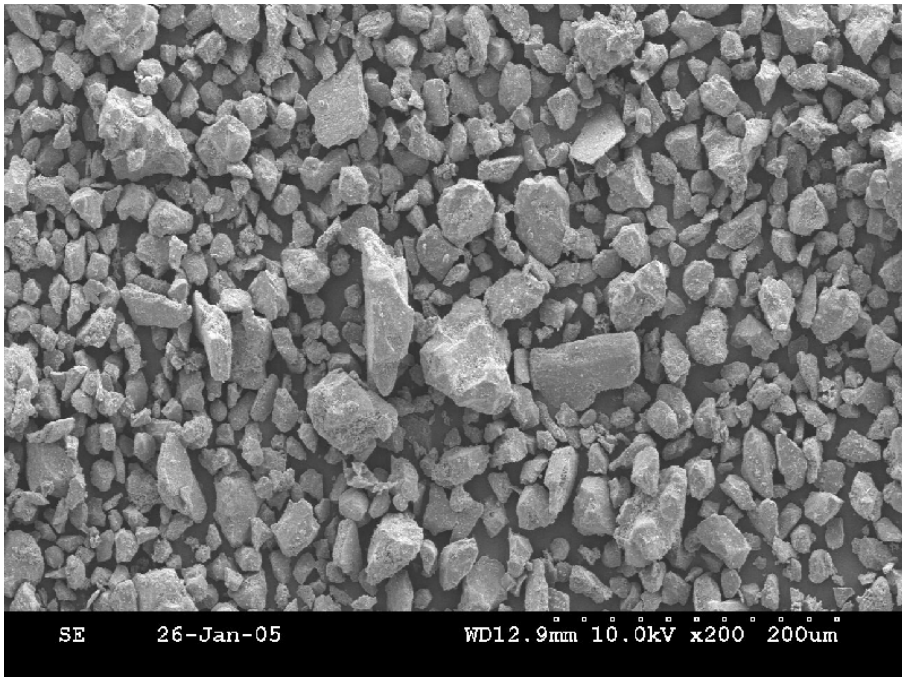


FIG. D9: Sample "Blend 76"; High C3A, 6.9% CKD
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



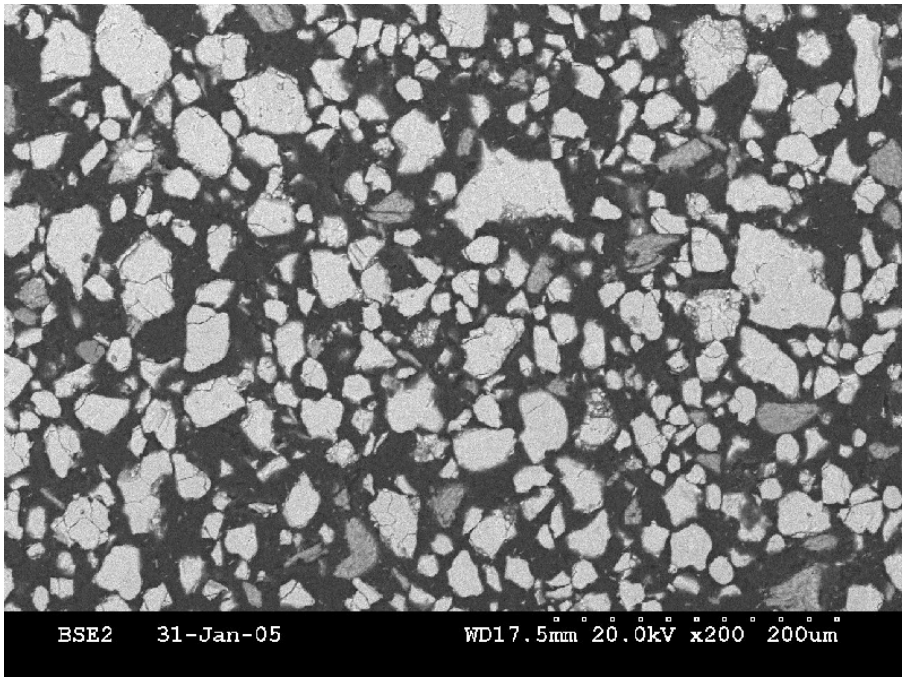
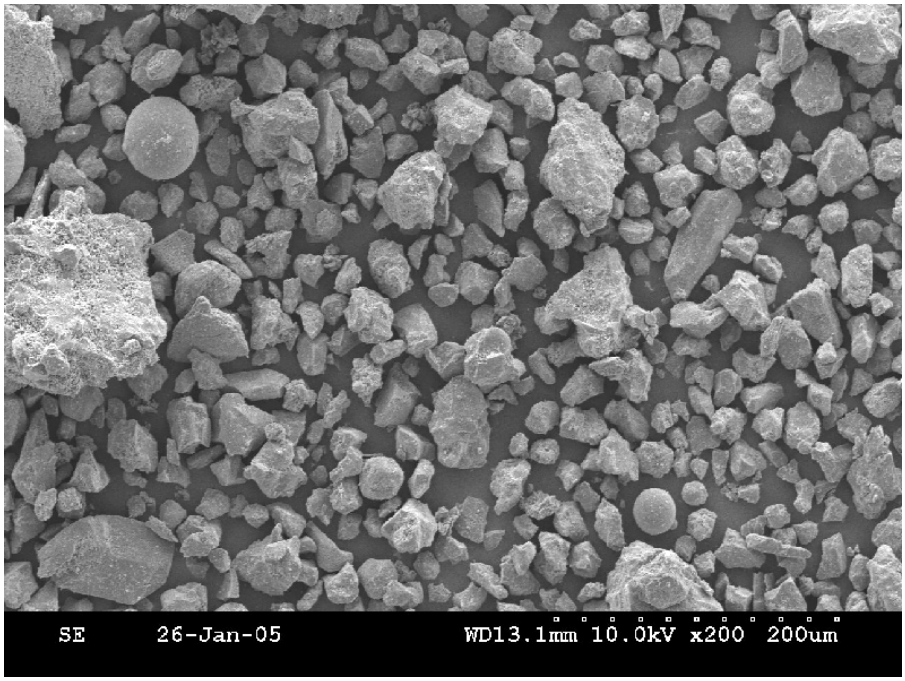


FIG. D10: Sample "Blend 78"; LS (Mid C3A and 3.5% limestone), no addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



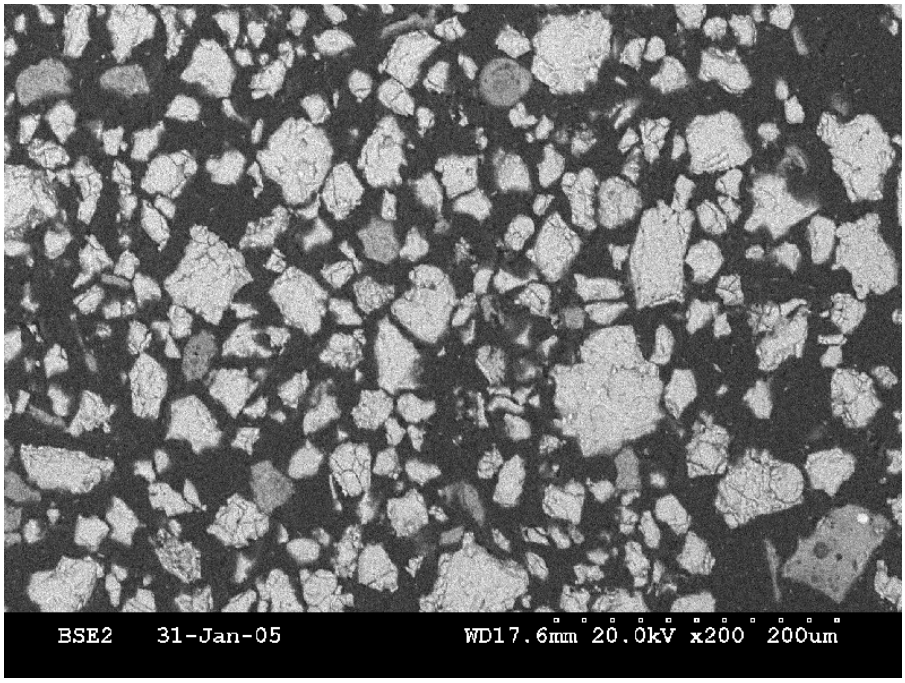
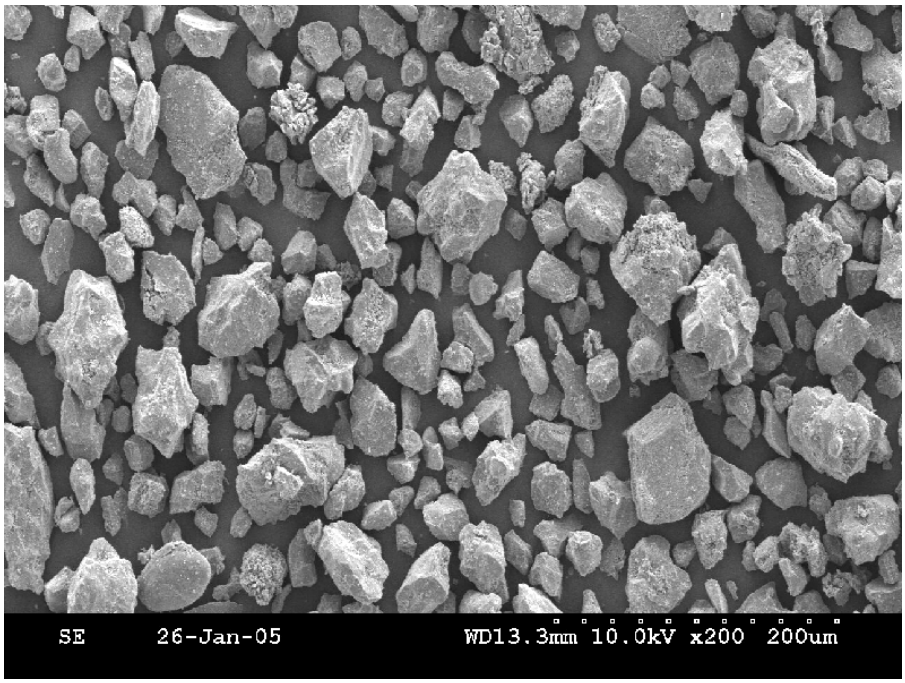


FIG. D11: Sample "Blend 85"; LS (Mid C3A and 3.5% limestone), 3% F fly ash addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



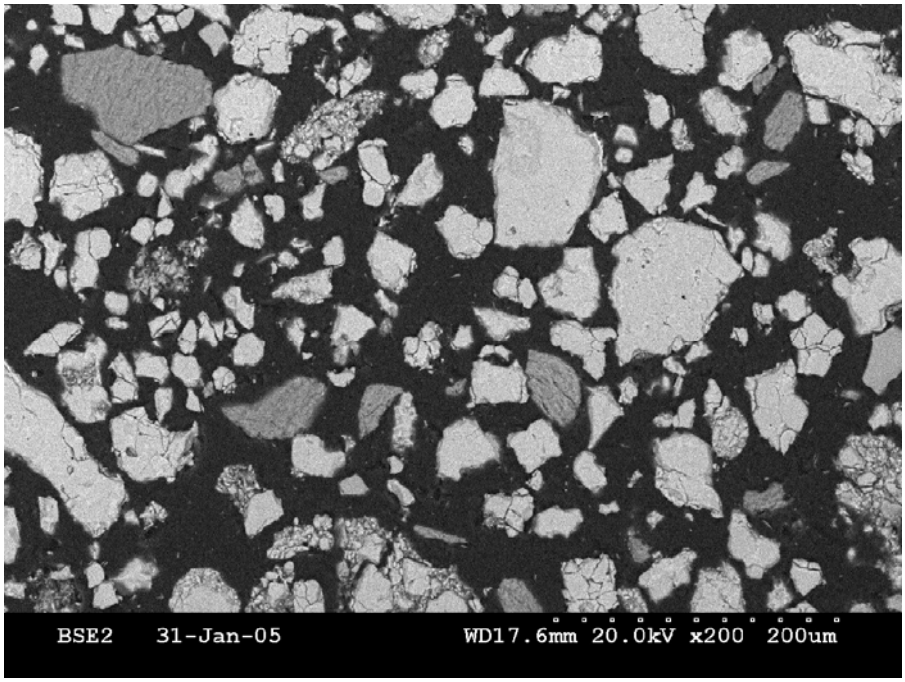
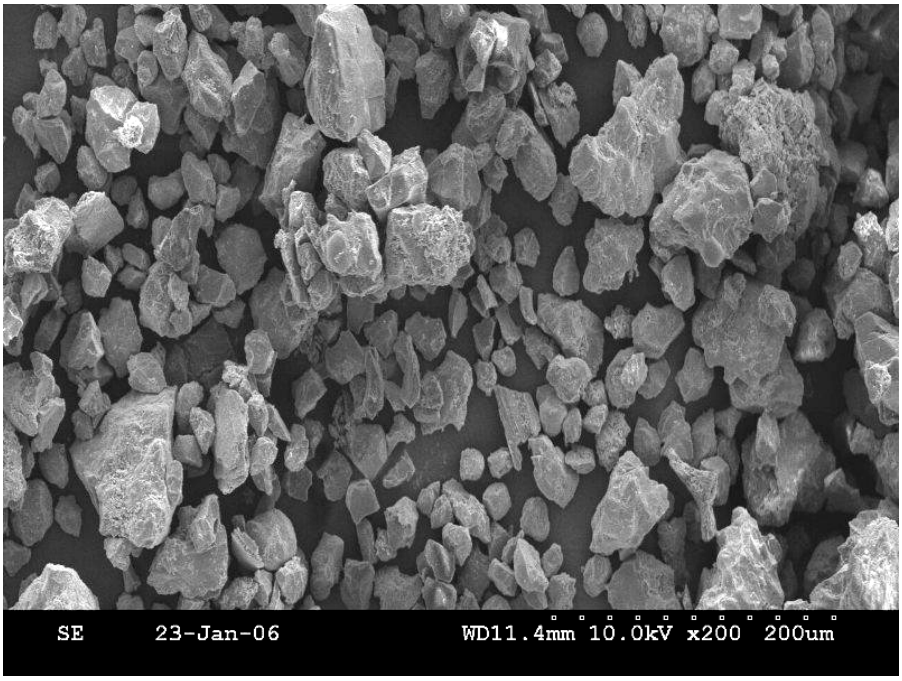


FIG. D12: Sample "Blend 91"; LS (Mid C3A and 3.5% limestone), 7.5% slag addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



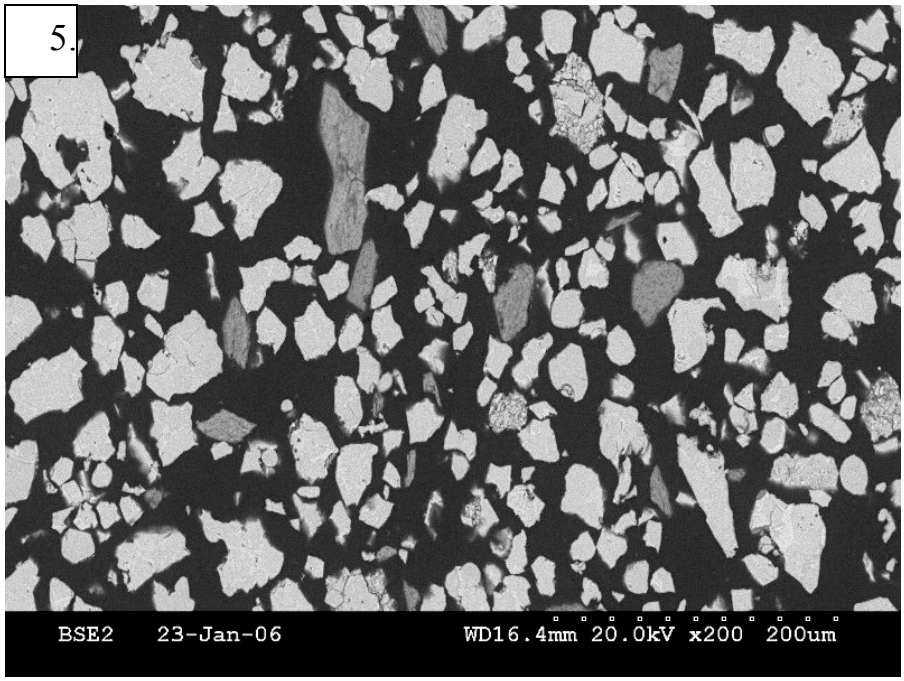
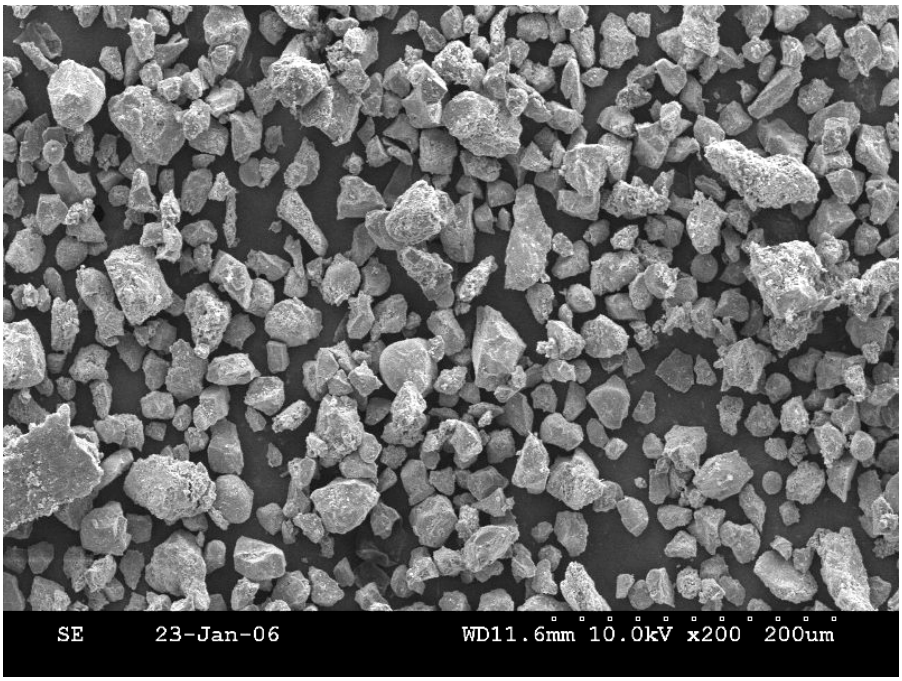


FIG. D13: Sample "Blend 100"; Mid C_3A, No addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section



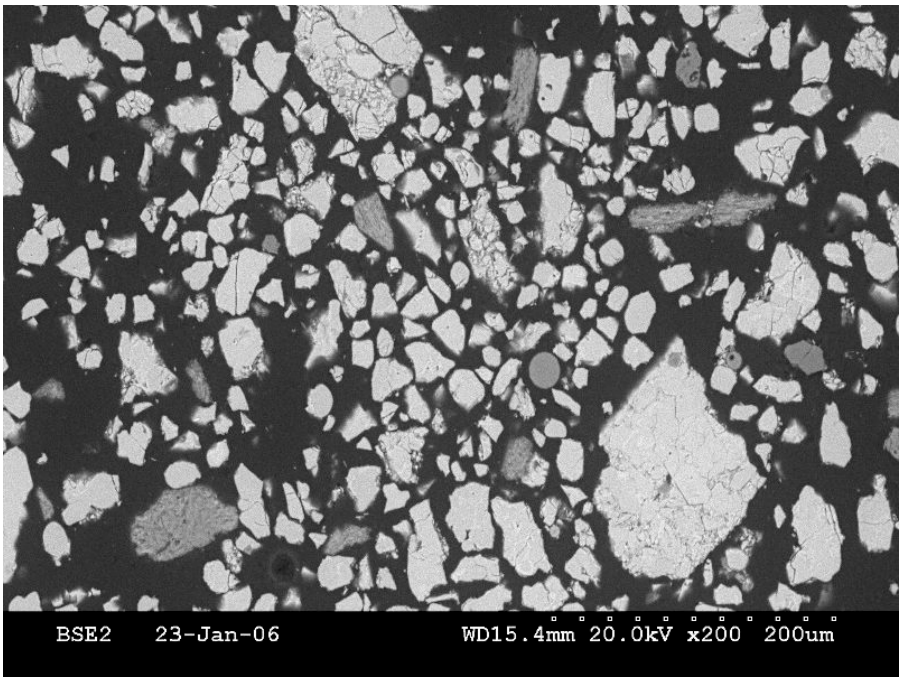


FIG. D14: Sample "Blend 106", Mid C_3A, 3% F fly ash addition
A) SEM-SEI of powder-mounted sample
B) SEM-BSI of polished section